

presented for reconsideration in view of the foregoing amendments and following remarks. It is noted with appreciation that claim 4 was found to recite allowable subject matter, although objected to on formal grounds. Claim 4 has now been rewritten in independent form as new claim 21, and its scope is unchanged, except that the limitation that the transfer chamber is "circular" has been dropped. This limitation is present in new claim 22, which depends from new claim 21. It is believed that claim 21 remains allowable notwithstanding this change in scope.

Claims 1, 3 and 14 were "rejected under 35 U.S.C. §102(b)" as being anticipated by the Yamamoto et al. reference. Claims 2 and 5-11 were "rejected under 35 U.S.C. §103(a)" as being unpatentable over the Yamamoto et al. reference, and claims 12 and 13 were also rejected under §103(a) based on an asserted combination of the Yamamoto et al. reference with the Kroecker reference.¹

Claim 1, as now amended, is directed to a "vacuum processing system" including "a transfer chamber adapted to couple to at least one processing chamber and at least one load lock chamber". The transfer chamber is also adapted "to house at least an end effector of a robot adapted to transport a substrate between the at least one processing chamber and the at least one load lock chamber". Finally, claim 1 continues to recite the former limitation of "a lid mounted on the transfer chamber wherein the lid has a curved configuration such that an edge of the lid is sealed to an edge of the transfer chamber and the lid is curved such that a center of the lid gradually increases its distance both

¹ Claim 15 was not explicitly accounted for in the Detailed Action, but it is believed that the Examiner's intention was to reject claim 15 on the basis of the Yamamoto et al. reference.

horizontally and vertically from the edge of the transfer chamber".

It is submitted that claim 1, as now amended, is patentably distinguished from the Yamamoto et al. reference. It is noted that the feeding section 20 of the etching apparatus of the Yamamoto et al. reference is not adapted to couple to a load lock chamber. Moreover, the apparatus of the Yamamoto et al. reference is not adapted to house at least an end effector of a robot (wherein the robot is adapted to transport a substrate between a processing chamber and a load lock chamber). It is further noted that the feeding section 20 of the apparatus of the Yamamoto et al. reference is substantially different from the type of transfer chamber now recited in claim 1, the recited transfer chamber being adapted to couple to both a load lock chamber and a processing chamber. Reconsideration and allowance of amended claim 1 is respectfully requested.

Claims 2-13 are directly or indirectly dependent on claim 1 and are submitted as patentable on at least the same basis as claim 1. Further with regard to claim 2, new claim 28 has been added which represents claim 2 rewritten in independent form, and unchanged in scope, except that the former limitation that the transfer chamber is "circular" has been omitted. Of particular note is the limitation of claim 2 (and new claim 28) that the transfer chamber lid "has a convex configuration such that the lid center is vertically closer to an inside area of the transfer chamber as compared to an edge of the lid".

The Examiner apparently acknowledges that the Yamamoto et al. reference fails to anticipate a transfer chamber lid having a convex configuration. The Examiner asserts that in the absence of persuasive evidence that th

particular configuration of the lid was significant, the particular shape is "a matter of choice". In response to this point, applicant respectfully observes that the present application amply demonstrates the significance of the convex configuration of the lid. In particular, it is stated in the present application at page 8, lines 9-18, that the convex configuration of the lid reduces the volume inside the transfer chamber, thereby improving efficiency of operation and reducing the potential for particulate contamination. Thus the claimed lid configuration is significant and is not a mere matter of choice. For these reasons, it is respectfully requested that the rejection of claim 2 be reconsidered and withdrawn, and that new claim 2 be allowed.

Claim 14, as amended, is directed to a "vacuum processing system", including "a transfer chamber having a domed lid", "one or more process chambers attached to the transfer chamber" and "one or more load lock chambers attached to the transfer chamber".

As amended, claim 14 is believed to be patentably distinguished from the Yamamoto et al. reference. It is noted that the Yamamoto et al. reference fails to show "one or more load lock chambers attached to" a transfer chamber. It is also noted that the feeding section 20 of the etching apparatus of the Yamamoto et al. reference is very different in structure from the type of transfer chamber which, as recited in claim 14, has one or more load lock chambers attached thereto.

It is therefore submitted that the rejection of claim 14 should be reconsidered and withdrawn. Claim 15, which is dependent on claim 14, is submitted as patentable on at least the same basis as claim 14.

Finally, regarding the Examiner's taking of official notice that structures for absorbing stress, such as an "S" transition, are well known, Applicant respectfully traverses this assertion and requests that the Examiner provide a reference (particularly relating to a lid of a transfer chamber) in support of his position. (MPEP 2144.03)

Turning now to the newly added claims, claims 21, 22 and 28 have been previously discussed.

New claim 23 is in independent form and recites a transfer chamber that is coupled to at least one processing chamber and to at least one load lock chamber. A robot is included that is adapted to transport a substrate between the at least one processing chamber and the at least one load lock chamber via the transfer chamber. Claim 23 further recites a lid mounted on the transfer chamber and having a curved configuration as recited in claim 1. It is noted that neither the Yamamoto et al. reference nor the other prior art of record discloses or suggests a transfer chamber as recited in claim 23, with a curved lid.

Claim 24 is also in independent form, and recites a vacuum processing system that includes a transfer chamber having at least one processing chamber coupled thereto and at least one load lock chamber coupled thereto. Claim 24 further recites a robot adapted to transport a substrate between the at least one processing chamber and the at least one load lock chamber via the transfer chamber. Finally, claim 24 recites a domed, horizontally disposed member adapted to form an airtight seal with the transfer chamber

No such transfer chamber, with a domed, horizontally disposed member that forms an airtight seal

with the transfer chamber, is taught or suggested by the prior art of record.

Claim 25 is dependent on claim 24 and is submitted as patentable on at least the same basis as claim 24.

New claim 26 is in independent form, and like claim 23, recites a transfer chamber adapted to be coupled to at least one processing chamber, adapted to be coupled to at least one load lock chamber, and also adapted to have a robot at least partially installed therein, where the robot is adapted to transport a substrate between the at least one processing chamber and the at least one load lock via the transfer chamber. Claim 26 further recites a domed horizontally disposed member forming an airtight seal with the transfer chamber. No such transfer chamber with a domed, horizontally disposed member, is taught or suggested by the prior art of record.

Claim 27 is dependent on claim 26 and is submitted as patentable on at least the same basis as claim 26.

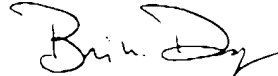
In view of the foregoing, it is submitted that all of the pending claims are in condition for allowance. Passage to issue is respectfully requested.

A separate Request for One-Month Extension of Time is attached hereto. Please charge Deposit Account No. 04-1696 in the amount of \$110.00 for the one-month extension fee. Also, please charge Deposit Account No. 04-1696 in the amount of \$306.00 for the fee required for presenting five additional independent claims in excess of the three independent claims and three additional claims in excess of the twenty claims.

Applicant does not believe any other fees are due regarding this Amendment. If any additional fees are required, however, please charge Deposit Account No. 04-

1696. Applicant encourages the Examiner to telephone Applicant's attorney to discuss the amendment should any issues remain.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brian M. Dugan". The signature is stylized with a large, looping initial "B" and a trailing flourish.

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Dated: June 14, 2002
Tarrytown, New York

VERSION MARKED TO SHOW CHANGESIn the Specification:

The paragraph beginning at page 3, line 24 has been amended as follows:

It is a further advantage of the invention that the configurations of the domed [transition] transfer chamber lid convex to the chamber can decrease the volume of the transfer chamber. Decreased volume can decrease the manufacturing costs as well as decreasing microcontamination.

The paragraph beginning at page 5, line 13 has been amended as follows:

It must be noted that as used herein and in the appended claims, the singular forms "a", ["and",] "an", and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "a substrate" includes a plurality of such substrates and reference to "the metal" includes reference to one or more metals and equivalents thereof known to those skilled in the art, and so forth.

The paragraph beginning at page 7, line 25 has been amended as follows:

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. section 1.8(n))
I hereby certify that, on the date shown below, this correspondence is being:

☒ transmitted by facsimile to the Patent and Trademark Office.

Brian M. Dugan
Signature
Brian M. Dugan
(name of person certifying)

6/14/02
Date

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In operation, the [substrate] substrates to be processed in the system 100 are placed on the top of the pod loaders 116. Then a robot (not shown) begins removing the [substrate] substrates, one at a time, out of the pod loaders and into one of the load lock chambers 108. After the substrates have been loaded into the load lock chamber 108, the pressure in the load lock chamber is reduced to match that in the transfer chamber 102. Then the door on the transfer chamber side is opened, and the transfer chamber robot (not shown) can begin servicing the load lock chamber 108. The transfer chamber robot moves the substrates from the load lock chamber 108 to one of the process chambers 104 for processing, and afterwards moves the substrates back to one of the load lock chambers 108. When the load lock chamber 108 has received all of the processed substrates, the pressure in the load lock chamber is returned to that of the mini-environment, so the robot within the mini-environment can move the processed substrates back to substrate pod 116.

The paragraph beginning at page 11, line 3 has been amended as follows:

The structural features of the dome may be introduced during manufacturing, e.g., an "S" could be introduced by metal spinning during the fabrication of the spun domed lid. Structural features such as the "S" transition can also be introduced by methods such as roll forming either before [of] ~~or~~ after the dome spinning.

The paragraph beginning at page 12, line 3 has been amended as follows:

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As it is critical to minimize contamination within the transfer chamber, the internal side of the domed lid is preferably cleaned following manufacturing (e.g., by sanding, finishing, electro-polishing, etc.) or, in the case [its] it is desirable to use the lid for both convex and concave placement, sanding or finishing both sides of the dome. An exemplary electro-polishing process that may be used to finish the domed lid of the invention is described in U.S. [Pat] Pat. No. 4,330,381. This processing step after manufacture of the lid removes contaminating particles that are undesirable in the sterile environment of the transfer chamber of a vacuum processing system and can provide a smooth surface of the domed lid for ease of handling and use. Where only one placement of the lid is envisioned, the domed lid can be spun so that the finished surface is internal to the transfer chamber.

In the Claims:

Claims 1, 3, 14 and 15 have been amended as follows.

1. (Amended) A vacuum processing system, comprising:

a [circular] transfer chamber adapted to couple to at least one processing chamber and at least one load lock chamber and to house at least an end effector of robot adapted to transport a substrate between the at least one processing chamber and the at least one load lock chamber; and

a lid mounted on the transfer chamber where the lid has a curved configuration such that an edge of the lid is sealed to an edge of the transfer chamber and the lid is curved such that a center of the lid gradually increase

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its distance both horizontally and vertically from the edge of the transfer chamber.

3. (Amended) The vacuum processing system of claim 1, wherein the lid has a concave configuration such that the lid center is vertically further from an inside area of the transfer chamber [a] as compared to an edge of the lid.

14. (Amended) A vacuum processing system comprising:

a transfer chamber having a domed lid; [and
one or more process chambers attached to th
transfer chamber; and
one or more load lock chambers attached to
the transfer chamber.

15. (Amended) The vacuum processing system of claim [11] 14, wherein the system further comprises a substrate mover for transferring the substrate within the transfer chamber.